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# Factors Impacting Seniors' Usage of Technology

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## ABSTRACT

Reports are indicating that seniors' rate of usage of technology is significantly increasing. Such change creates new market for companies. Majority of the existing literature examines the technology usage by junior adults (those younger than 50 years old). This study empirically examines the antecedents of seniors' usage of computers. This research, thus, fills a gap in the literature and points out critical factors for practitioners. The data are collected using survey methodology. Three hundred twenty three participants provided the data used in the analysis of the model. Linear Regression is used to assess the hypotheses. The data showed that IT support and the different tasks, such as e-commerce and search, significantly impact the usage of computers by seniors. Satisfaction and security concern were also found to have an influence. The implications, directions for future research, and limitations are discussed.

## Keywords

Technology usage, older, security concern, satisfaction.

## INTRODUCTION

Seniors' rates of technology adoption and usage is significantly increasing (PewInternet, 2017). There has always been a digital divide between younger (less than 50 years old) and older individuals (older than 50 years) because younger adults tend to use more technology than seniors. However, the distance between these two groups is decreasing with time. In a recent study, PewInternet (2017) found that the Internet usage rate by seniors American in 2017 was 67% whereas this rate was just 14% in 2000 (PewInternet, 2017). Thirty-two percent of seniors American owned tablet computers in 2017, while less than 10% had tablets in 2013 (PewInternet, 2017). The adoption and usage rate of smartphone by seniors Americans has also increased by 24% (from 18% to 42%) from 2013 to 2017 (PewInternet, 2017). These significant changes call for research to investigate the drivers of technology usage by seniors. In this research, we develop and empirically examine a research model that examine the antecedents of seniors' usage of technology (computers). Seniors are those who are older than 50 years. Technology usage is a direct measure that counts the number of tasks used on the computer and is not a question in the questionnaire that asks about perception.

Technology has become an important pillar in individuals' life (Merhi, 2018). Convenience is one the advantages of technology. Instead of personally visiting physical places, they can conduct the same transactions from home. Seniors can use technology to order groceries online, communicate with their loved ones, search for medical information, play games, pay bills, etc. (Hill, Beynon-Davies, and Williams, 2008; McMurtrey, Zeltmann, Downey, and Mcgaughey 2011; Quan-Haase, Martin, and Schreurs, 2016). In addition, technology, and especially social networking, has been found to have positive impact on seniors' lives because it reduces the loneliness and depression levels (Chopik, 2016; Peek, Wouters, van Hoof, Luijkx, Boeije, & Vrijhoef, 2014; Wilson, 2018).

Researchers that examined the antecedents of technology adoption and usage by junior adults have investigated the influence of many factors and theories. It is noticed that the influence of the same factors have been explored on seniors' usage of technology with the exception of few studies that examined the impact of some theories. For instance, Lian and Yen (2014) examined the drivers and barriers affecting seniors' intention to use e-commerce. Their study was based on the Unified Theory of Acceptance and Use of Technology (UTAUT) and innovation diffusion theory. Lian and Yen (2014) found that only two factors: performance expectation and social influence impact the intention to adopt e-commerce by seniors. These indicate that the factors and theories found earlier to have influence on juniors' behavior may not have the same impact on

seniors. For this reason, this research attempts to close a gap in the literature by investigating the influence of factors that were found to be significant in shaping young adults behaviors' towards technology.

In this research, we specifically examine the impact of e-commerce usage, the tasks used on the device, information search, IT support, security concern, and satisfaction on seniors' usage of computers. Actual usage of computers is used in this study and not intention to use. Actual usage was measured by how many times an individual used the technology. Previous studies confirmed that the factors identified in this research are critical drivers of individuals' behavior to adopt and use technology. To our best knowledge, no study has yet empirically examined the impact of these factors on seniors' decision to use the technology. In a focus group, Mitzner, Boron, Fausset, Adams, Charness, Czaja, Dijkstra, Fisk, Rogers, and Sharit (2010) reported that seniors perceive technology to be convenient. They also found that security, activity support, reliability, and complexity are critical issues that seniors mentioned during the interviews. This study, examine whether these factors are indeed antecedents to technology usage or not.

The remainder of this paper is organized as follows. Section 2 provides the theoretical background and presents the hypotheses that are assessed by this paper. In Section 3, we discuss the methodology followed by the analysis. The discussion and implication of the results are then presented. We finally conclude the paper by highlighting key contributions made by this paper and identifying the limitations and areas for future research.

## RESEARCH MODEL AND HYPOTHESES

In this section, we discuss the hypotheses and the research model. The first four hypotheses may seem intuitive for the reader. However, even when relationships are intuitive, their empirical confirmation lends strength to the existence of the phenomena in the real world. These four hypotheses deal with the impact of different transactions on technology usage. For seniors, to the best of our knowledge, no study has examined the influence of transactions types on technology usage. We expect that the more seniors use e-commerce, do tasks on a device, search for health information, and having a device will increase their usage of the computers. Based on this, we hypothesize:

*H1: Greater level of e-commerce usage positively impact the technology usage rate.*

*H2: Greater tasks done on a device positively impact the technology usage rate.*

*H3: Greater number of information search positively impact the technology usage rate.*

*H4: Having a device positively impact the technology usage rate.*

Many research found that IT support is critical for technology adoption and usage in organizations (Bhattacharjee and Hikmet, 2008; Cenfetelli and Schwarz, 2011). To our best knowledge, no study has examined the impact of IT support on seniors' decision to adopt and use the technology. We argue that the more support seniors have the more likely they will use the technology. The reason is because as humans we tend to resist any change and stay in the comfort zone which is usually what we have been doing for a while. Technology usually forces individuals to change how things are done. Having support on the technological changes and having someone as a point of reference when having any issue caused by the technology will improve the perceptions towards the technology. This in turn increases the usage rate of the technology. Based on this reasoning, we hypothesize:

*H5: Greater IT support positively impact the technology usage rate.*

DeLone and McLean (1992) and Bhattacharjee and Premkumar (2004) suggested that user satisfaction is a key element that determine the success of technology. Prior studies regarding the adoption and usage of technologies have validated the importance of user satisfaction and found it to be a reliable predictor of intention to IT use (Joo, So, and Kim, 2018; Vroman, Sajay, and Catherine L., 2015; Wixom and Todd, 2005). No study has examined the relationship between satisfaction and seniors' usage of technology. We argue that the more seniors are satisfied the more likely they will use the technology. Thus,

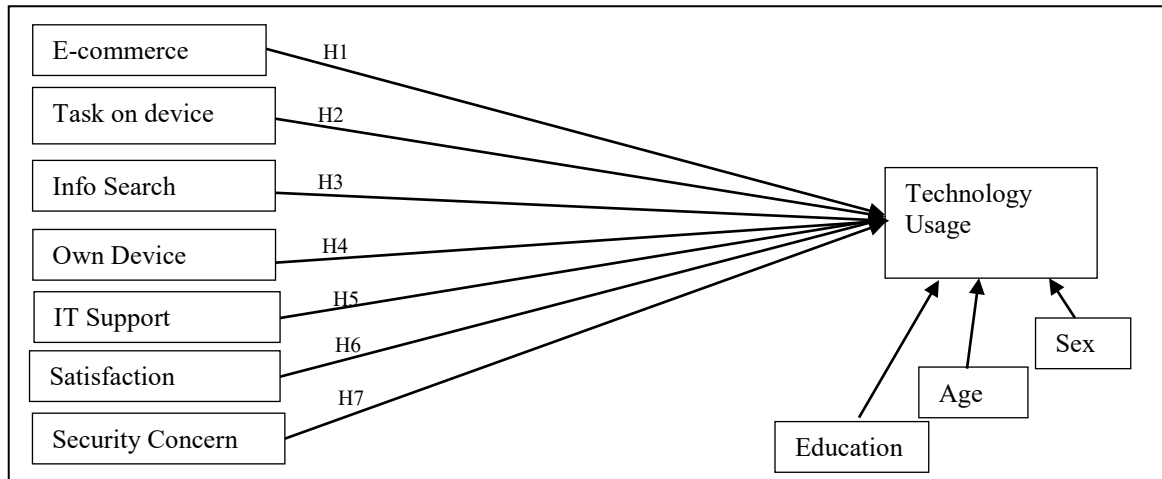
*H6: Greater satisfaction positively impact the technology usage rate.*

Internet security is a very critical antecedent to technology adoption and usage (Merhi and Ahluwalia, 2019). Transactions done through the Internet require users to often enter sensitive information such as credit card numbers and their personal

information in web based applications. Perception of lack of adequate security is a major reason why many consumers do not use electronic transactions (Merhi and Ahluwalia, 2018). Based on this, we hypothesize:

*H7: Greater security concern negatively impact the technology usage rate.*

Figure 1 depicts the hypotheses presented in this study.



**Figure 1. Research Model**

## METHODOLOGY

Survey methodology was used to collect the data. The data were collected by the UK Data Service. The sample is composed of 323 seniors who are over 50 years old. The questionnaires were collected face-to-face during a pre-planned event in the United Kingdom.

## ANALYSIS

In order to get a better idea about the disparity of the data used in this study, a descriptive statistics was applied. The results are presented in Table 1. The results especially those of mean and standard deviation indicate that there are disparities among the participants in this study. Moreover, from Table 1, the skewness and kurtosis measures show that the data of the variables used in this study are normally distributed. Normality is one of the assumptions that should be tested before running multivariate analysis. The results yielded in this table, ensure that other multivariate tests could be executed later. Besides, more information about the shape of the distribution could be found in the results. Most of the skewness values are positive which means that the mass of the distribution is concentrated to the left. At the same time, most of the kurtosis values are negative which means that the shape of the distribution is not peaked.

	Minimum	Maximum	Mean	Std. Deviation	Variance	Skewness	Kurtosis
E-Commerce	0	7	1.93	2.298	5.281	.913	-.475
Info Search	0	4	.69	.976	.954	1.258	.558
Tasks on device	0	8	3.56	2.497	6.235	.123	-1.136
Own device	1	2	1.11	.312	.097	2.528	4.423
IT Support	1	6	1.56	1.049	1.101	2.252	5.116
Satisfaction	1	4	2.70	.787	.620	-.482	-.055
Security Concern	1	5	2.67	1.548	2.396	.283	-1.435
Technology usage	0	37	11.52	9.538	90.965	.791	-.228

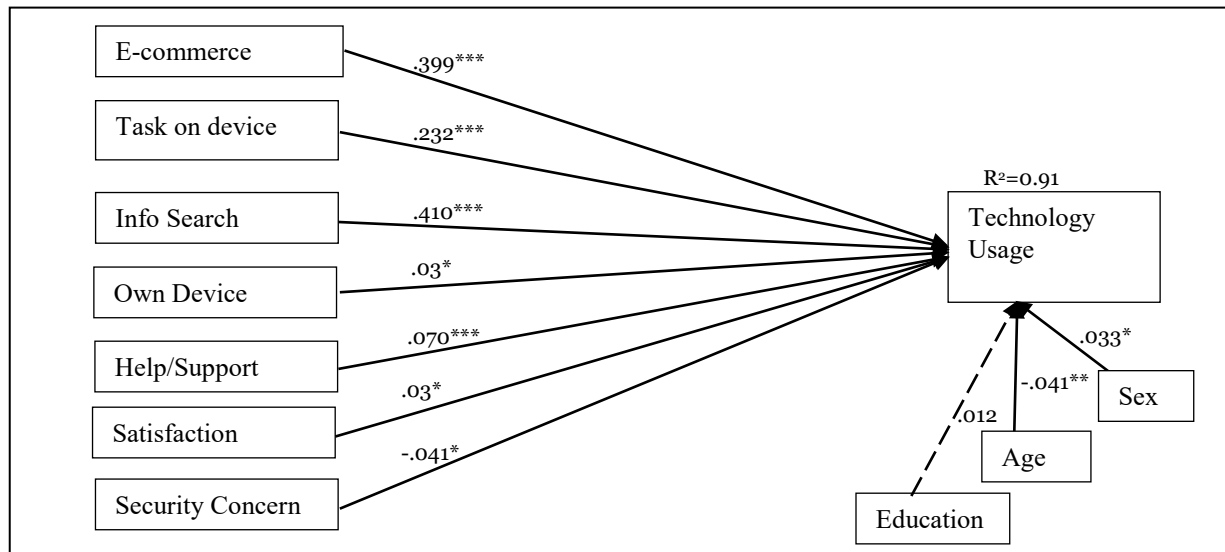
**Table 1: Descriptive Statistics**

After executing the descriptive analysis, we performed correlation analysis to examine whether relationships exist among the factors. The results are displayed in Table 2. By examining the bivariate correlation analysis, one can assess the relationship between different variables used in this study.

	E-Commerce	Organizational tasks	Info Search	Technology usage	Own device	IT Support	Satisfaction
Tasks on device	.622**						
Info Search	.652**	.562**					
Technology usage	.850**	.746**	.836**				
Own device	-.201**	-.175**	-.286**	-.284**			
IT Support	.287**	.408**	.299**	.430**	-.107		
Satisfaction	.196**	.223**	.259**	.281**	.044	.183*	
Security Concern	-.013	.003	.065	-.010	-.121	.053	-.089

**Table 2: Correlation Analysis**

To assess the hypotheses presented earlier in the study, we used SPSS. The results are shown in Figure 2. The results of PLS analysis show that all the hypotheses are supported at different statistical levels. The R-squared parameter measures the variance of endogenous latent variable that is explained by the independent latent variables. The  $R^2$  found in this study is .91 which means that the independent variables identified explain 91 percent of the variance of seniors' actual technology usage.



**Figure 2. Results**

\*\*\*: statistically significant at 0.001 level; \*\*: statistically significant at 0.05 level; \*: statistically significant at 0.1 level; dashed line: no significant

## RESULTS AND DISCUSSION

Reports on technology usage are indicating the rate of technology by seniors is increasing which is interesting for companies because this means that a new market is developing. Thus, investigating the factors that enhances and prohibits seniors' from using the technology is critical. Few studies noted this and started the investigation. However, there is still a lack of studies in the existing literature. This paper investigates few relationships that have not been addressed with the seniors' usage of technology.

We hypothesized that different tasks such e-commerce, information search for health related issues, and other tasks may increase the technology usage. Although these are intuitive relationships, we thought that it is good idea to valid them. The data confirmed these relationships. In fact all three relationships are statistically significant at 0.001 level.

This paper also examines the impact of satisfaction on computer usage. Extant literature has confirmed this relationship with junior adults, however it is not known whether satisfaction has the same impact on seniors or not. The results of this paper indicate that satisfaction influences seniors' level of technology usage.

IT support is another factor that was assessed in this study and was found to be significant predictor for seniors' usage of computers/technology. To our best knowledge, this is the first study that examines this relationship. This means that the more seniors have support in the technology, the more they will use it. This result has implications for practitioners. Organizations aiming to target seniors adults need to look at the IT support and customer service they are offering to their customers especially the seniors.

Security Concern is another factor that has not been examined in the extant literature. The data of this study indicated that security negatively influence the seniors' usage of technology. Most of the electronic transactions nowadays have to be done online which means that the device is connected through the Internet. The Internet is not secure and thus all the documents and files saved on the device are at risk. The results showed that the higher the perception of security, the less seniors use the computers.

## CONCLUSION

The main motivation of this research is the lack of research that examined the influence of specific factors on seniors' usage of technology. Most of the existing research investigated the antecedents of junior adults' usage of the technology. This research examines the impact of satisfaction, security concern, IT support, and different tasks on the usage of the computers. Thus, this paper makes a significant contributions to theory and practice by proposing and confirming the influence of these factors on seniors' adoption of the technology. The data indicated that these factors are important antecedents to seniors' usage of computers.

Although this research makes substantive contributions, its limitations need to be acknowledged. These limitations also offer opportunities or future research. The sample was collected from the United Kingdom. In order to confirm the generalizability of the findings, the model proposed in this study may need to be validated in diverse settings. Validating this model in other locations/countries and considering the culture will definitely enrich the body of knowledge and enhance our understanding of the factors impacting seniors' usage of computers.

## REFERENCES

1. Bhattacharjee, A., and Hikmet, N. (2008) Reconceptualizing organizational support and its effect on information technology usage: Evidence from the health care sector, *Journal of Computer Information Systems*, 48, 4, 69-76.
2. Cenfetelli, R. T., and Schwarz, A. (2011) Identifying and testing the inhibitors of technology usage intentions, *Information Systems Research*, 22,4, 808-823.
3. Chopik, W. J. (2016) The benefits of social technology use among older adults are mediated by reduced loneliness. *Cyberpsychology, Behavior, and Social Networking*, 19, 9, 551-556.
4. Hill, R., Beynon-Davies, P., and Williams, M. D. (2008) Older people and internet engagement: Acknowledging social moderators of internet adoption, access and use, *Information Technology & People*, 21, 3, 244-266.
5. Joo, Y. J., So, H. J., and Kim, N. H. (2018) Examination of relationships among students' self-determination, technology acceptance, satisfaction, and continuance intention to use K-MOOCs, *Computers & Education*, 122, 260-272.
6. Lian, J. W., and Yen, D. C. (2014) Online shopping drivers and barriers for older adults: Age and gender differences, *Computers in Human Behavior*, 37, 133-143.

7. Mcmurtrey, M. E., Zeltmann, S. M., Downey, J. P. and Mcgaughey, R. E. (2011) Seniors and technology: Results from a field study, *Journal of Computer Information Systems*, 51, 4, 22-30.
8. Merhi, M. I. (2018) Does National Culture Have Any Impact on E-Government Usage? *International Journal of Technology Diffusion*, 9, 3, 29-45.
9. Merhi, M. I., and Ahluwalia, P. (2018) Digital economy and corruption perceptions: a cross-country analysis, *International Journal of Digital Accounting Research*, 18, 28-46.
10. Merhi, M. I., and Ahluwalia, P. (2019) Examining the impact of deterrence factors and norms on resistance to Information Systems Security, *Computers in Human Behavior*, 92, 37-46.
11. Mitzner, T. L., Boron, J. B., Fausset, C. B., Adams, A. E., Charness, N., Czaja, S. J., Dijkstra, K., Fisk, A. D., Rogers, W. A., and Sharit, J. (2010). Older adults talk technology: Technology usage and attitudes, *Computers in human behavior*, 26, 6, 1710-1721.
12. Peek, S. T., Wouters, E. J., van Hoof, J., Luijkx, K. G., Boeije, H. R., and Vrijhoef, H. J. (2014). Factors influencing acceptance of technology for aging in place: a systematic review, *International journal of medical informatics*, 83, 4, 235-248.
13. PewInternet (2017) Technology use among seniors, *Pew Research Center Internet & Technology*, available online at <http://www.pewinternet.org/2017/05/17/technology-use-among-seniors/> Accessed on February 19, 2019.
14. Quan-Haase, A., Martin, K. and Schreurs, K. (2016) Interviews with digital seniors: ICT use in the context of everyday life, *Information, Communication & Society*, 19, 5, 691-707.
15. Vroman, K. G., Sajay A., and Catherine L. (2015) Who over 65 is online? Older adults' dispositions toward information communication technology, *Computers in Human Behavior*, 43, 156-166.
16. Wilson, C. (2018) Is it love or loneliness? Exploring the impact of everyday digital technology use on the wellbeing of older adults, *Ageing & Society*, 38, 7, 1307-1331.
17. Wixom, B. H., and Todd, P. A. (2005) A theoretical integration of user satisfaction and technology acceptance, *Information Systems Research*, 16, 1, 85-102.